

ON INNERVATION AND THE FUNCTIONS OF
THE SYMPATHETIC NERVES.

Dr. J. E. CULVER read a paper with this title. He reviewed at length the distribution and functions of the sympathetic nervous system, and traced the relationship between its disturbed innervation and the interference with the respiration, oxidation of the blood and other physiological processes.

BASEDOW'S DISEASE.

Dr. WILLIAM H. THOMSON read a paper on this subject. He began by stating that the progress of pathology often illustrates the disadvantage of the premature naming of diseases after some of their common or prominent symptoms, for further knowledge may show the disease to have much wider relationships than at first suspected, and in some cases exist without these symptoms being present. If such be the case, the symptomatic name may then operate to prevent a correct diagnosis. The name exophthalmic goitre has had much influence in preventing the recognition of Graves' disease in many instances, and still more in confusing the views of its pathology. In reading the numerous contributions on the pathology of this interesting affection, it is striking to note how predominately the conception of some textural lesion in the nervous system that would account for the exophthalmos and the goitre has diverted either the investigation or the speculation, in seeming forgetfulness of the fact that these symptoms are not essential to the affection, because they may be both present, with Dr. Graves' disease absent, or both absent with Graves' disease present. The safest rule to follow in pathological problems is to seek first for the most constant characteristics of a given complaint, rather than for the most obtrusive ones. Thus the most uniform condition in Graves' disease is what may be correctly described as a state of marked agitation: in many instances it is for a long time a purely physical state, not involving the mind or the spirits, and yet the patient acts as if greatly alarmed about something. This has led many writers to pronounce fright to a leading cause of the disease. We are thus at the outset diverted from the study of a truly characteristic condition to that of a most occasional element in the clinical history of the affection. While

fright may be the occasion of the first manifestation of chorea or of Graves' disease, a blow the occasion of the development of a mammary cancer, etc., it is only a hindrance to our progress towards a correct pathology of these diseases to put down any one of the varying occasions of their first manifestation as their cause.

Dr. Thomson then gave the histories of his last eight consecutive cases of Graves' disease in private practice. In none of these cases was fright or any other emotion an element of the clinical history. With two exceptions, they were unusually free from causes of mental strain or depression. Exophthalmos and goitre were wholly absent in one of these eight cases. Exophthalmos alone was absent in five. Goitre was absent in one, while in another it was only slightly present late in the disease. Both exophthalmos and goitre were marked only in one case. In all the cases there was pronounced tachycardia and muscular tremor. Emaciation was marked in five and moderate in three. In four, imperfect inspiratory power was noticed.

The rapid heart action and the muscular tremor are the first symptoms to develop in this disease, and the last to disappear, and together they constitute the most invariable elements of the disease. Our attention, therefore, should be particularly directed to them as the most related to its pathology, and the most important practically, as the earlier the recognition of the disease, the better for the patient. As to its pathology, a paralytic lesion, involving the common nucleus of the glossopharyngeal, vagus and spinal accessory nerves, and extending to the neighboring vaso-motor centre in the medulla would account for the whole group of symptoms which make up the picture of Graves' disease. Simple irritation of the lower branches of the glosso-pharyngeal and the superior laryngeal nerves is sometimes accompanied by general muscular tremor. Such a bulbar lesion would also explain the tachycardia and the universal relaxation and throbbing of the systemic arteries. It would also explain the interference with the inspiratory expansion. Such a lesion would not, however, account for the exophthalmos or the goitre, and when we turn to pathological anatomy, we have no constant evidence of any textural lesion in the medulla, either of the above mentioned centers or of other parts. No characteristic anatomical change has yet been discovered which can be casually associated with the genesis of Graves' disease,

and we must look elsewhere for the origin of the malady. Here we may be aided by our clinical experience. Persistent diarrhœa is a common symptom in Graves' disease. In the cases referred to above, astringents and other drugs had very little effect in checking the diarrhœa, while a change of diet at once brought about an improvement in all the symptoms. Since 1880, Dr. Thomson said, he mainly relies on the dietetic treatment in Dr. Graves' disease, with such favorable results that he now has little doubt that a specific disorder of intestinal (in distinction from gastric) digestion is the primary factor in the genesis of this affection. While a structural lesion in the medulla which would account for the phenomena of Graves' disease is almost inconceivable without it sooner or later involving all the vital functions of that seat of life, yet particular functional derangements produced by toxic agents of intestinal origin are just what might be expected, for nothing is more characteristic than the narrowly selective operation of functional nervous poisons, which may go on for years, as in the case of opium, affecting certain functions without producing either progressive changes in them, or extension to other functions. One fact in Dr. Graves' disease which points much more distinctly to a digestive disorder than to a structural nervous lesion is that it occurs in women about ten times as often as in men. That the digestive apparatus in women is subject to special disorders is notorious. The speaker said he has not yet seen a severe case of Graves' disease in which diarrhœa was not, sooner or later, a pronounced symptom. As regards the diet in these cases, the amount of meat taken should be restricted, and milk, preferably in the form of matzoon, should be substituted. Medicinally, he employs the intestinal antiseptic remedies, and the tincture of *stropanthus* as a vaso-motor tonic.

Dr. E. C. SEGUIN said that while there are undoubtedly cases of Graves' disease in which one or two of the three prominent symptoms—the exophthalmos, the goitre and the tachycardia—are absent, he was inclined to believe that the reader of the paper had rather exaggerated the number of cases in which the principal symptoms are those relating to the circulation. Unquestionably, we see cases in which the only gross symptoms are the rapid heart action and the tremor, but these are comparatively rare. On the other hand, there are cases which present these symptoms to which

he should hesitate very much to give the name Graves' disease. It has appeared to him that in many cases of disease of the heart with dilatation or tachycardia, there is apt to be associated with it a muscular tumor and considerable nervousness. In arriving at a diagnosis of Graves' disease, there are other symptoms to assist us to which Dr. Thomson did not refer. One is the character of the pulse. The mere fact of the pulse being rapid is not in itself characteristic of Basedow's disease; it should possess a quality of tension and smallness which to the experienced finger is of value in making the diagnosis. Then again, the temperature of these patients is invariably raised, amounting to an increase of one-half to one degree F. in the axilla. In making a diagnosis of Graves' disease without the exophthalmos of the goitre, the speaker said he should wish to find, besides the tachycardia, the peculiar character of the pulse and the slight elevation of temperature. As to the pathology of the disease, Dr. Seguin said that any theory as to the location of the lesion in the central nervous system or in the medulla has failed to satisfy him. As to locating the general cause of the disease in the intestinal tract, as the author has ingeniously done, no positive conclusions can be drawn for the reason that the diarrhœa is by no means a frequent symptom in Dr. Graves' disease. He has observed in only a few cases. Furthermore, it does not resemble a fermentative diarrhœa; it is of a paralytic nature, with large, liquid, frequent evacuations. In conclusion, Dr. Seguin referred to the value of aconitia in treating the disease.

Dr. B. SACHS said he agreed with Dr. Seguin as regards the symptoms of the disease. He should hesitate to make a diagnosis of Dr. Graves' disease in a case in which both the exophthalmos and the goitre were wanting. What we do find with extreme frequency is that one of these two cardinal symptoms only is present, together with the characteristic arterial disturbance. Another symptom of the disease to which attention has lately been called is that the upper eye-lid does not follow the motion of the pupil downwards. This does not appear to be due to mechanical causes, but is an independent symptom. He has seen it present in a case where there was almost no exophthalmos. Severe diarrhœa he has found rarely associated with other symptoms of Graves' disease. A diarrhœa due to the condition of the larger intestines was present in some cases, and in these

he was struck by the peculiar fact that it did not appear to be exhausting the patient. In regard to the theory put forth by Dr. Thomson, we must remember that while putrefactive changes in the intestines are very common, exophthalmic goitre is a rare disease. Dr. Sachs said he has found the "rest treatment" extremely beneficial in treating this affection, the heart's action becoming better and the goitre diminishing in size. In addition to rest, he puts the patients on a light diet, principally milk and eggs.

Dr. GEORGE W. JACOBY said that in certain cases, where only one of the cardinal symptoms was present, it is often a difficult matter to draw the line between Grave's disease and some other form of neurosis. In undeveloped cases of Dr. Graves' disease, the "rest treatment" was particularly beneficial. As regards the ocular symptom, the failure of the upper lid to follow the pupil downwards, the patient has perfect control over the voluntary closure, but the reflex blinking of the lid is almost entirely lost. There may be loss of sensation of the cornea associated with it.

Dr. MARY PUTNAM JACOBI said that most authors referred to depressing emotions as a cause of Graves' disease. She mentioned three cases coming under her observation in which such antecedent cause was extremely obvious. In one of these, a very severe case, the patient was a woman, aged 22 years, whose marriage engagement was broken by the sudden death of her fiancé. She rapidly developed the three typical symptoms of Graves' disease, with intense anorexia and diarrhoea. She remained in a state of great prostration for six months, and subsequently recovered by marrying somebody else. Following her second pregnancy her symptoms reappeared. She was living at that time almost entirely on champagne, which seemed to greatly intensify the symptoms. The diarrhoea did not appear to add to her prostration. The patient was put entirely on a meat diet, and the pulse rapidly fell from 150 to 90 per minute, and she regained her strength. In another case, occurring in a woman aged 42 years, the symptoms appeared after prolonged family troubles. The third case referred to was also in a woman, a servant by occupation, who developed the symptoms after a prolonged nursing of her mistress, to whom she was much attached.

Dr. JOSEPH COLLINS said that if we could ascribe a

toxic origin to exophthalmic goitre, as suggested by Dr. Thomson, the prognosis of the affection would not be as it is. The speaker referred to certain experiments he has made on the thyroid in animals. Complete extirpation of the gland is almost invariably followed by death. This would controvert the idea that its function was a metabolic rather than a secretive one.

Dr. A. D. ROCKWELL said he was interested in Dr. Thomson's statement that only one or two of the cardinal symptoms were present in the cases narrated. As far as the speaker's observation goes, the three typical symptoms were usually present. He referred to the value of digitalis in cases where there is a weakness of the myocardium: he has found the drug very serviceable, in combination with iron, zinc and ergot. He also referred to the value of electricity: in order to do any good, the current must be sufficiently powerful. In reply to a question, Dr. Rockwell said that the diminished resistance to the electrical current in these patients is probably owing to the perspiration and to the better conduction due to the rapid circulation.

The PRESIDENT said he did not think that any explanation thus far given will cover all the cases of this disease, and it is doubtful that we will ever find a single explanation for any functional nervous disease. Different cases undoubtedly have a different etiology. In two cases of Graves' disease recently coming under his observation, a sudden fright was too immediate to be anything but causative. One of the patients, a woman, saw her baby fall from the second story window. She was immediately seized with palpitation, and within two weeks developed the exophthalmos and the goitre. She presents a very interesting symptom that has been referred to by Charcot, a sudden giving out of the limbs—ostasia. After such a collapse she is perfectly able to rise and walk away. In another case the symptoms suddenly developed in a patient after she had narrowly escaped being run over by a street car. Dr. Starr said he would follow Dr. Thomson's suggestions as to diet in these cases. Strophanthus he had found very valuable. Electricity has proven disappointing in his hands as a remedial agent in Graves' disease.

Dr. THOMSON, in closing the discussion, said that in his paper he did not intend to go over the entire symptomatology of Basedow's disease. Such occasional symptoms as the loss of the hair, pigmentation of the

skin, etc., he did not refer to all. Neither did he mean to imply that fright and depressing emotions are not repeatedly the occasion for the first development of the symptoms. We must try to separate occasions from true causes. The tremor of Graves' disease is characteristic; it is entirely different from the tremor of any cardiac affection he has ever met with. He did not maintain in his paper that there was any lesion in the medulla to account for these symptoms: he only meant to show that as no such lesion had been demonstrated, it lends strong light to the toxic theory. These poisonous ptomaines may act, by selection, on certain parts of the nervous system. The relapsing nature of Graves' disease is against the idea that they depend on a structural lesion.

In reply to Dr. Seguin, Dr. Thomson said that in those cases where we get a high tension pulse, it is associated with albuminuria. In Graves' disease there is a dilatation of the arteries throughout the body, and dilated arteries and a high tension pulse do not go together. As regards the temperature, the speaker said there is a slight elevation, such as we find in any serious neurosis, but it bears no proportion to the rapid heart action, and the affection may be essentially regarded as a non-febrile disease.